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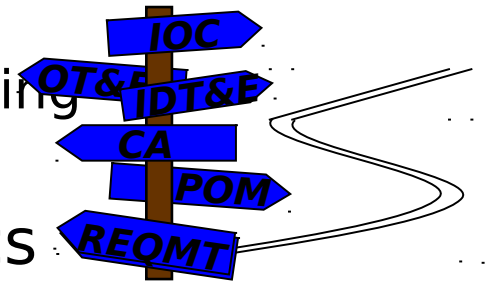
Integrated Master Plan/ Integrated Master Schedule (IMP/IMS)

Course Outline

- IMP/IMS Philosophy
  - Overview
  - Definitions
  - Events, Accomplishment, & Criteria
- IMS Description
- IMS Development
- IMS Execution
- Summary

Government Roadmap of IMP/IMS

- "Big Picture" view of program
  - Do it early!
  - Shows key events, capabilities evolution, schedule, constraints
  - Supports POM; helps fight budget cuts
  - Shows key schedule interfaces with supporting programs/activities/contracts



- Becomes framework for Program Metrics
- Review *regularly* with *all the players*
  - Communication tool of progress, problems, and "heading check"
  - Update government roadmap as required with IMS

IMP & IMS Overview

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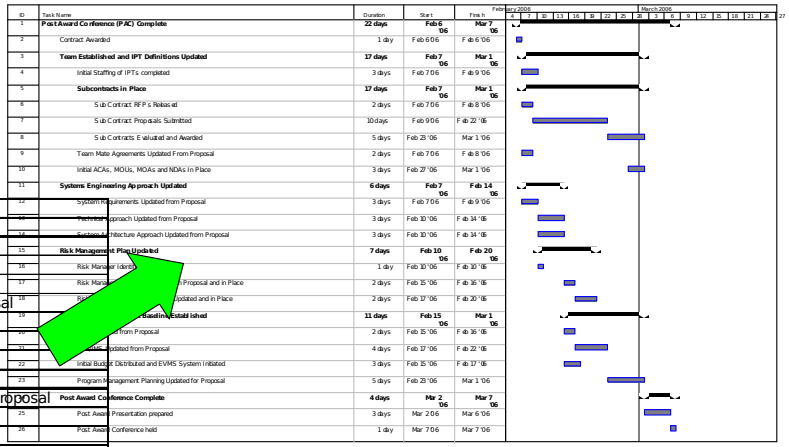
Important Characteristics

Post Award Conference (PAC) Complete		
	Contract Awarded	
	Team Established and IPT Definitions Updated	
		Initial Staffing of IPTs completed
		Subcontracts in Place
		Team Mate Agreements Updated From Proposal
		Initial ACAs, MOUs, MOAs and NDAs In Place
	Systems Engineering Approach Updated	
		System Requirements Updated from Proposal
		Technical Approach Updated from Proposal
		System Architecture Approach Updated from Proposal
	Risk Management Plan Updated	
		Risk Manager Identified and in Place
		Risk Management Plan Updated from Proposal and in Place
		Risk Register and Mitigation Plans Updated and in Place
	Performance Measurement Baseline Established	
		WBS Updated from Proposal
		IMP/IMS Updated from Proposal
		Initial Budget Distributed and EVMS System Initiated
		Program Management Planning Updated for Proposal
	Post Award Conference Complete	
		Post Award Presentation prepared
		Post Award Conference held


ID
Task Name
Duration
Start
Finish
February 2006
March 2006
1 Post Award Conference (PAC) Complete 22 days Feb 6 '06 Mar 7 '06
2 Contract Awarded 1 day Feb 6 '06 Feb 6 '06
3 Team Established and IPT Definitions Updated 17 days Feb 7 '06 Mar 1 '06
4 Initial Staffing of IPTs completed 3 days Feb 7 '06 Feb 9 '06
5 Subcontracts in Place 17 days Feb 7 '06 Mar 1 '06
6 Sub Contract RFPs Released 2 days Feb 7 '06 Feb 8 '06
7 Sub Contract Proposals Submitted 10 days Feb 9 '06 Feb 22 '06
8 Sub Contracts Evaluated and Awarded 5 days Feb 23 '06 Mar 1 '06
9 Team Mate Agreements Updated From Proposal 2 days Feb 7 '06 Feb 8 '06
10 Initial ACAs, MOUs, MOAs and NDAs In Place 3 days Feb 27 '06 Mar 1 '06
11 Systems Engineering Approach Updated 6 days Feb 7 '06 Feb 14 '06
12 System Requirements Updated from Proposal 3 days Feb 7 '06 Feb 9 '06
13 Technical Approach Updated from Proposal 3 days Feb 10 '06 Feb 14 '06
14 System Architecture Approach Updated from Proposal 3 days Feb 10 '06 Feb 14 '06
15 Risk Management Plan Updated 7 days Feb 10 '06 Feb 20 '06
16 Risk Manager Identified 1 day Feb 10 '06 Feb 10 '06
17 Risk Management Plan Updated from Proposal and in Place 2 days Feb 15 '06 Feb 16 '06
18 Risk Register and Mitigation Plans Updated and in Place 2 days Feb 17 '06 Feb 20 '06
19 Performance Measurement Baseline Established 11 days Feb 15 '06 Mar 1 '06
20 WBS Updated from Proposal 2 days Feb 15 '06 Feb 16 '06
21 IMP/IMS Updated from Proposal 4 days Feb 17 '06 Feb 22 '06
22 Initial Budget Distributed and EVMS System Initiated 3 days Feb 15 '06 Feb 17 '06
23 Program Management Planning Updated for Proposal 5 days Feb 23 '06 Mar 1 '06
24 Post Award Conference Complete 4 days Mar 2 '06 Mar 7 '06
25 Post Award Presentation prepared 3 days Mar 2 '06 Mar 6 '06
26 Post Award Conference held 1 day Mar 7 '06 Mar 7 '06

Integrated Master Plan (IMP)

- *Event based plan*
- *Contractual vehicle*
- *Relatively top level*

Integrated Master Schedule (IMS)

- *Calendar based schedule*
- *Level of detail necessary for day-to-day management*

Consistent with contractor's management & scheduling system structure format

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Basic Definitions…

The Integrated Master Plan

- Bilateral agreement on what defines the “event-driven” program
- Documents the key events, accomplishments and criteria in the development, production and/or modification of a system
- Sequential events, points (generally meetings) to assess program progress
- A contractual document

The Integrated Master Schedule

- **Made up of “tasks” depicting work effort needed to complete the “criteria”**
- **Detailed time-driven plan for program execution to help ensure on-time delivery dates achieved**
- **Tracking & status tool during program execution**
- **Detailed tool to show progress, interrelationships and dependencies**
- **Contract deliverable – should be BASELINED**

IMP/IMS References

- DODI 5000.02 requires IMS (Table 5, page 44, 2 Dec 08)
- Policy letter signed by OUSD(A), 7 Mar 05
  - IMP/IMS -- Now mandatory for Cost Reimbursable or Incentive Contracts >$20M including subcontracts
    - Contracts between $20 & $50M – Can tailor IMS
    - May apply to FFP based on MDA
    - Check Part 7 of the OMB Circular A-11 for more details
  - Effective for all contracts for issued since 6 Apr 05
    - Policy change not retroactive to prior/current contracts
- DOD IMP/IMS Guide
  https://acc.dau.mil/CommunityBrowser.aspx?id=19397

The IMP & IMS is used... Where, When and By Whom

- Used by Government
  - Communicate program to stakeholders
  - Primary tools for validating progress
  - Determine proposal confidence during source selection
  - Assess earned-value metrics and help determine award fee
- Used by Contractor
  - Tool to help manage program
    - Aids in program planning & replanning
    - Allows measurement of program progress
    - Helps manage risk identification/mitigation
  - Allows communication to show
    - What will be delivered
    - How it will be delivered
    - When it will be delivered

IMP Philosophy Purpose

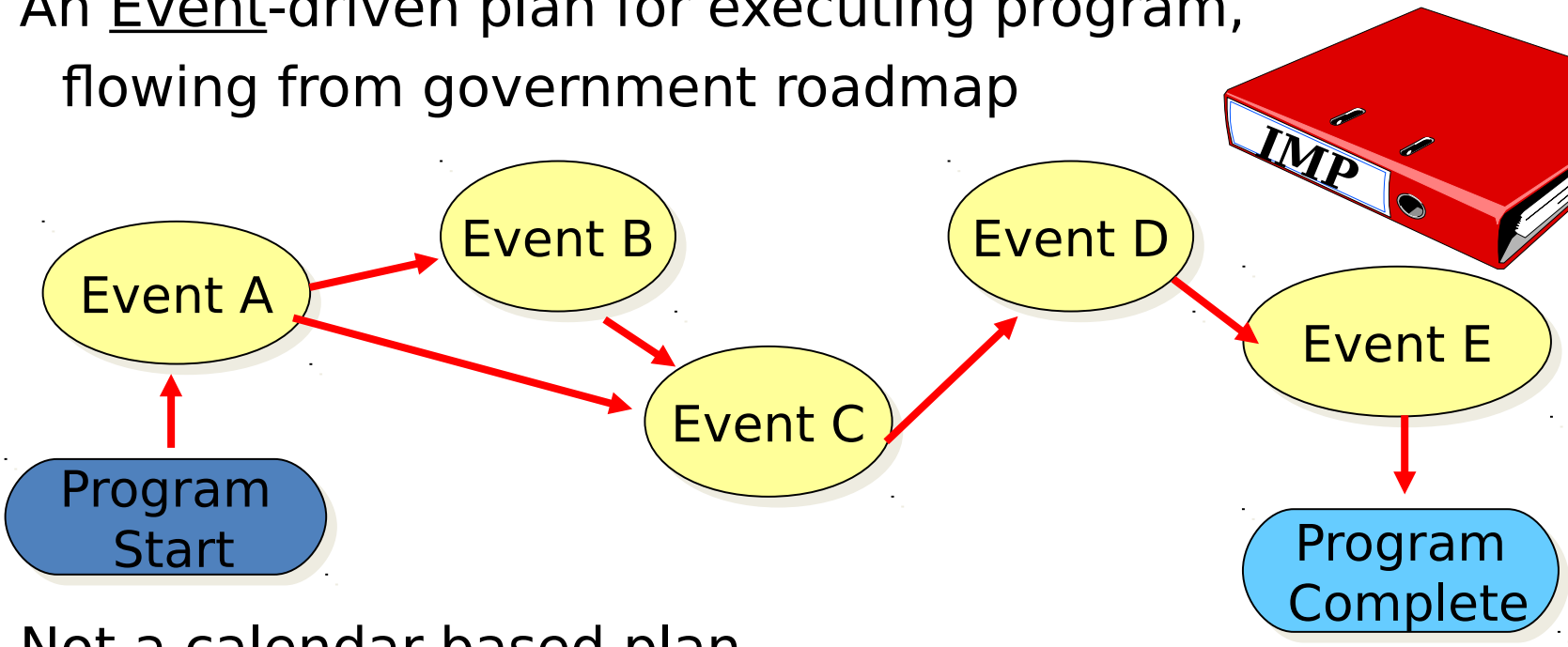
- Defines single plan establishing fundamental program
- Defines hierarchical, Event-based plan that contains:
  - Events
    - Significant accomplishments
    - Entry and exit criteria
  - But no dates or durations
- Provides
  - Sufficient definition for program progress and completion tracking

A valuable tool for both proposal and execution

  - "What and How" of program

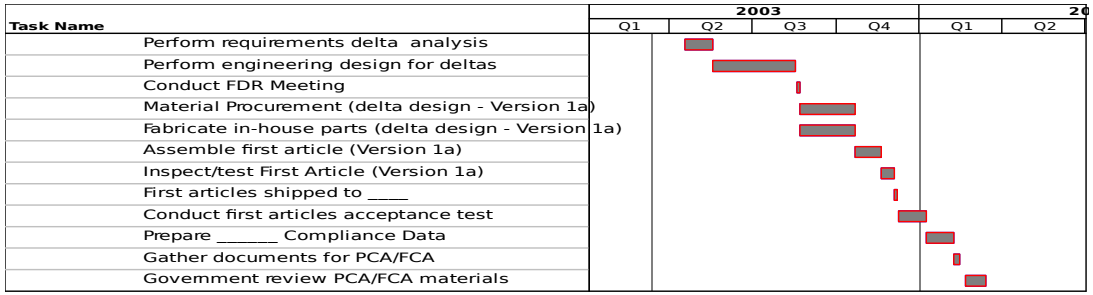
IMP Description

- An Event-driven plan for executing program, flowing from government roadmap



- Not a calendar-based plan
- Becomes a contractual document
  - Top-level control and progress management
  - Through establishment of Events and associated Accomplishments, and Criteria

The Critical Path



- The sequence of activities (tasks) in the network that has the longest total duration through the program/project
- Activities on the critical path have zero or negative slack/float time
  - If a critical path activity slips, program completion slips
  - Used to evaluate schedule impact when individual activities are delayed
- Critical path should be highlighted in report formats
- Monitor constantly providing information with respect to program risk
- Provide a sense of overall ability to execute

Critical path cannot be the only management tool used – other analysis is required

Linkage to Other Program Activities

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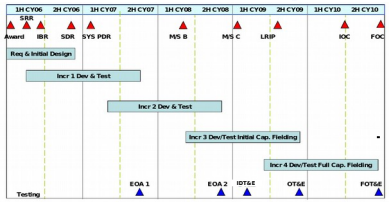
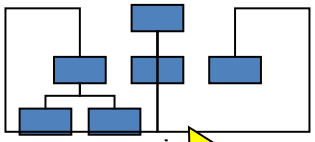
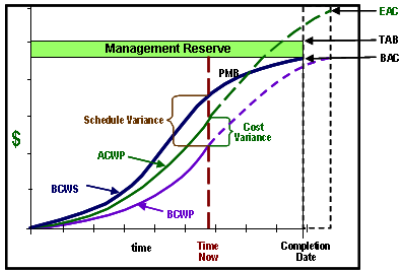
Government Roadmap



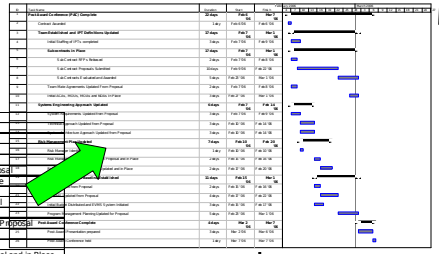
WBS/CWBS



EVMS



IMS



IMP

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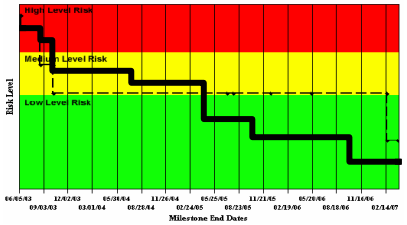
RMP



SEP

IBR

IMP & IMS provide critical process & product linkages

IMP and IMS Link to Other Program Activities

- Work Breakdown Structure (WBS)
  - IMP/IMS should have traceability to WBS
- Earned Value Management System (EVMS)
  - Uses same source information – together EVMS and IMS provide complete program health picture
- Integrated Baseline Review (IBR)
  - IMS and allocated baseline established and executable
  - Risk mitigation activities included
- Systems Engineering Plan (SEP)
  - IMP and SEP show organizational and Task integration
  - Demonstrates maturation of product through disciplined systems engineering (SE) process
- Program risk management
  - Incorporate risk mitigation Tasks into IMS

Typical steps to developing an IMP

- Outline program using government Roadmap
- Determine IMP structure/organization
- Identify Events, Accomplishments, Criteria
- Prepare Introduction and Narratives if required
- Complete trace to WBS, SOW, etc.
- Iterate Events/Accomplishments/Criteria with IPTs during IMS development
- Fill out glossary of terms

IMP Relationships

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Assess Program Progress

Events

Event readiness or completion provides a measure of p[illegible]ress

First Module Complet

Design Complete

Interim Activity COMPLETION

Accomplishments

Usually there are 2 or more Accomplishments for each Event

Measurable

Criteria

Usually there are 2 or more Criteria for each Accomplishment

Definitive Evidence

Preliminary Design Review Completed

Identify Events

- Logically sequenced points to assess program progress - Levels 1 of IMP
  - DoD reviews (e.g., Milestone A)
  - Program reviews (e.g., design, production readiness, and supportability reviews)
  - Tests, deliveries, and other key progress demonstration or risk mitigation points

First Module Complet

Events are the foundation of the plan

Identify Significant Accomplishments

- Activities or steps whose completion indicates progress toward starting or completing an event - Level 2 of IMP

- Might include
  - Deliveries of systems/subsystems
  - Completion of integration activities
  - Completion of readiness reviews

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Identify Criteria

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- Definitive measures/indicators that verify accomplishment completion - Level 3 of IMP
  - Completed work effort
    - e.g., Interface Agreements Completed
  - Confirmation of performance compliance
    - e.g., Integrated Test Report (ITR) Approved
  - Results of incremental verification
    - e.g., Component Certified
  - Completed critical process activities
    - e.g., Risk Management Plan Approved

“Security certification 90% complete”---doesn’t get i

IMP & IMS Applications

- IMP provides a checklist prior to events
- IMP & IMS supports
  - Execution planning and tracking
  - Systems engineering
  - Resource analysis
  - PM decision-making
  - Risk identification and mitigation
  - Progress monitoring
  - What-if drills

IMS Outline

- IMP/IMS Philosophy
- IMS Description
- IMS Structure
- IMS Development
- IMS Execution
- Summary

IMS Philosophy Purpose

- Flows directly from IMP, with added detail (Tasks)
- Estimates IMP completion dates using a network
- Displays schedule status and Critical Path – Insight & Early Warning
- Supports “what if” schedule exercises
- Provides:
  - Cost/Schedule integrity via WBS & SOW traceability
  - Earned Value Management System (EVMS) consistency
  - Ability to sort schedules multiple ways (e.g., Event, Integrated Product Team (IPT), or WBS)
- Expands on “how” and provides “when” for execution

Valuable tool to communicate status and risk

IMS Description

- Networked set of tasks to define when activities will occur
  - Includes Tasks and Subtasks (below IMP's Events, Accomplishments, Criteria) necessary to complete each Criterion
  - Task durations and scheduling logic added to generate resultant dates
- IMS first submitted as part of proposal with sufficient detail for government to make a selection
- Will be key tool for program execution

IMS Structure

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First Module Complete!

Events

Accomplishments

Design Complete

Criteria

PDR Completed

Tasks

***Note*: Real IMP/IMS would have two or more Accomplishments supporting each Event; each supported by multiple Criteria with multiple Tasks**

- ***Satisfy the Capability Development Document***
- ***Establish the Allocated Baseline***
- ***Validate stakeholder interfaces***
- ***Check for adherence to standards***

Schedule dates established via logic and task durations

IMS Development

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IMP

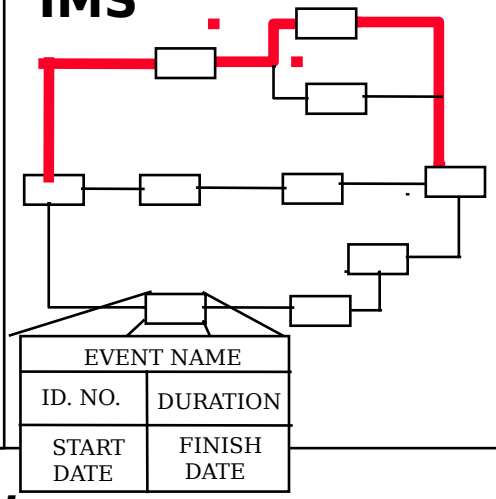
EVENT SIGNIFICANT ACCOMPLISHMENT ACCOMPLISHMENT CRITERIA TASK	ACTIVITY NUMBER	SOW REF
VMS CRITICAL DESIGN REVIEW (CDR)	JO3	1509
VMS DETAILED DESIGN COMPLETE	JO304	1509
VMS COMPUTER RESOURCES CDR COMPLETE FOR EACH CI	JO3060416	1520
MED DESIGN REVIEW UPDATE (DRU) COMPLETE	JO30616A	1520
PICC CDR COMPLETE	JO30616B	1520
POWER SUPPLY CDR COMPLETE	JO30616C	1520
METS CDR COMPLETE	JO30616D	1520
TPS CDR COMPLETE	J030616E	1520
TPS SW CDR COMPLETE	J030616F	1520
VMS VKS CDR COMPLETE	J030616G	1520
METS SOFTWARE BASELINE RELEASED	J030616H	1520
VKS CDR UPDATE COMPLETE	J030616I	1520
PICC SPEC V&V PLAN COMPLETE & AVAILABLE	J030616J	1520
VMS ACTUATORS CDR COMPLETE FOR EACH CI	J030616	1530
VMS ACTUATORS DESIGN & ANALYSIS COMPLETE		
VMS ACTUATOR INSTALLATION DRAWINGS UPDATED		
VMS ACTUATOR MODELING ANALYSIS COMPLETE		
VMS ACTUATOR VENDOR TEST PROCEDURES COMPLETE		

- **IMP expanded to incorporate tasks (Level 4's) required to accomplish the individual IMP criteria**
- **Time line applied**
- **Numbering consistent with IMP**

Level 4

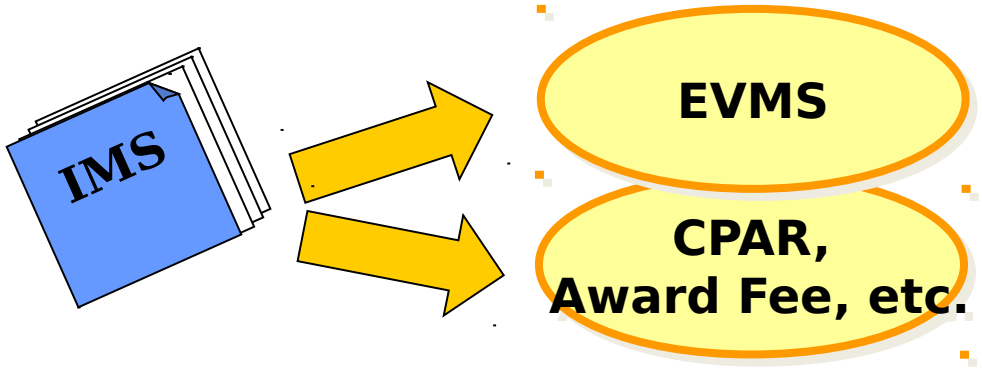
MEDS DESIGN REVIEW UPDATE(DRU) COMPLETE	J030616A
PICC CDR COMPLETE	J030616B
. . .	
PICC SPEC V&V PLAN COMPLETE & AVAILABLE	J030616J
PREPARE DRAFT V&V PLA	J030616J-01
SEND DRAFT TO CUSTOME	J030616J-02
DISCUSS CUST. COMMENT	J030616J-03
REVISE DRAFT TO FINAL	J030616J-04
COORDINATE FINAL WITH IPT LEADS	J030616J-05
SIGN AND ADD TO DATA ACCESSION LIST	J030616J-06
. . .	

IMS



Management Use of IMP & IMS

- Execution IMP/IMS important to providing baseline for communication of program status
- Used to execute day-to-day activities, assess progress, identify problems, assess work-arounds, define priorities
- Key indicator of contract performance; assessing scope and duration of remaining tasks



IMS Integration with EVMS

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- Complementary tools – but different purpose and characteristics

	Purpose	Characteristics
IMS	• Communicate **plan to execute** the program • **Provide a day-to-day tool** for management and tracking • **Forecast schedule impacts** using critical path analysis • **Forecast schedule completion**	• **Event-based**, activity relationship driven structure (superset of IMP) • Follows **systems engineering** process flow over entire program • Identify **schedule slack** (~management reserve) and **critical path**
EVMS	• Communicate **performance against a** defined schedule and cost **plan** (baseline) • **Measure, report** work package plan vs "actuals" -- in dollars • **Forecast EAC** by extrapolating SPI/CPI	• Detailed near term **work packages**, broader planning packages for later periods • Product oriented **WBS structure**; no schedule relationships defined • Allows for **cost management reserve**, but not schedule

IMS Quality Control

- Does schedule meet required delivery dates?
- Are all IMP Events/Accomplishments/Criteria, CLINs, & deliverables included
- Are durations reasonable (Generally 5 days < duration < 20 days)?
- Does logic flow make sense:
  - Links at summary level?
  - Missing links? Redundant links?
  - External links coordinated with affected IPT?
- Are constrained dates forcing negative slack?
- Do resources match between management tools? (IMS and EVMS integrated)
- Does Critical Path make sense?
- Is it BASELINED with a disciplined change control process?

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IMS Metrics

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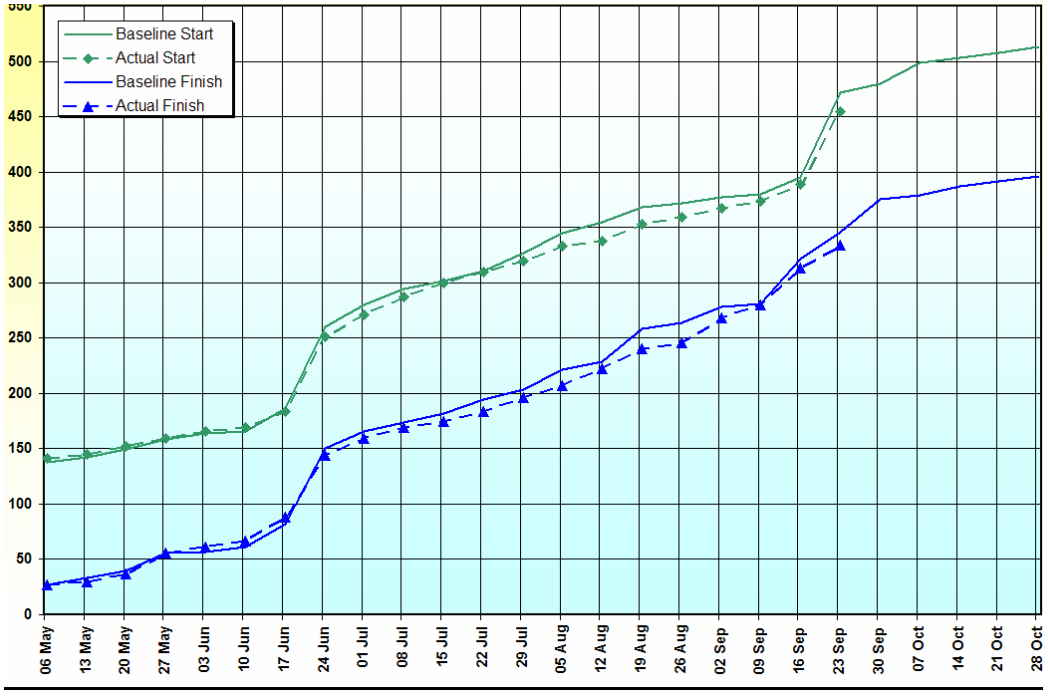
- Sample Metrics
  - Total Slack
  - Links
  - Date Constraints
  - Durations
  - Hit/Miss Ratio
  - S-Curve
  - Open Tasks



Metrics provide "indicator" of schedule health and drive behavior. Goal is good IMS – not just good metrics

IMP/IMS Lessons Learned

- This is a “Pay me now or pay me much more later” business
  - Avoid shortcuts around planning and scheduling
  - Update the plan and schedule as things change
- Your metrics can be no better than your plan and your schedule
- Program office and contractor must use the same set of metrics of program health
- Government and contractor must work as allies, not as adversaries
- Contractor and government must jointly own the IMS
- There’s no substitute for effective communication

Questions Informed PM Should Ask

- Does the Program Office have an IMP and an IMS?
- What is the “as of date” of the IMS?
- How does the team (both government & contractor) use the IMP and IMS?
  - Communication – Horizontal & Vertical
  - Accountability – Individuals assigned to each task
  - IMS baselined and change control process in place
- How do our IMP & IMS interrelate with other systems or tools (EVMS, Risk Management Plans, Schedule Risk Assessments)?

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IMP/IMS Summary

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- Two different concepts:
  - IMP is event-based - events, accomplishments & criteria
  - IMS is time-based – tasks, with durations & interconnections
- IMP and IMS are valuable management tools:
  - Systematic approach to planning, scheduling, and execution
  - Tools for improved day-to-day real program management
    - Supports budgeting, risks, and work-arounds
    - Strengthens government/contractor teamwork
    - Standard communication tool with senior management
  - Provides quantitative basis for evaluating contractor performance
- Greatly reduces surprises and risks

Recap and Feedback

- Thank-you for your interest and your participation
- Do you have any unanswered questions?
- Did we meet the objectives as stated?
- What can we do to improve this class for those who come behind you?
  - Please fill out the feedback sheet
  - Written comments are particularly helpful